



**US Army Corps  
of Engineers®**  
Engineer Research and  
Development Center

# Coastal Field Data Collection

## Pacific Islands Land-Ocean Typhoon Experiment (PILOT)

---

- Problem** Studies of methods to protect U.S. populations from the effects of landfalling tropical cyclones have been confined primarily to the continental United States. These studies have emphasized evacuation of large populations from coastal areas as a primary mitigation measure against the effects of coastal storm surge and maximum cyclonic winds. The methods used to protect mainland populations from cyclone effects may not be appropriate or effective in island environments. Cyclone effects that are of little or no concern to mainland residents may pose significant hazards in island environments. These effects can include terrain enhanced winds, elevated coastal water levels caused by wave-induced ponding on reefs, and mudslides caused by heavy rains. In contrast to mainland tropical cyclone hazard scenarios which have been extensively studied, island hazard scenarios have received little attention.
- Research Approach** Data depicting island-specific processes (e.g., wave induced ponding, wind-forced wave uprush) are inadequate or do not exist, consequently the physics of these processes are poorly understood, so adequate models are not available. A field laboratory and observing system on the island of Guam has been established to capture data at extreme wind speeds, wave heights, and coastal water levels. A near-shore directional wave buoy and a coastal water-level and meteorological station have been established, and shallow water wave gages and current meters have been deployed in a reef-rimmed lagoon. A field laboratory has been established in the Hawaiian Islands to acquire similar data under less extreme but more often occurring conditions. These data will be used to aid understanding of the physics of the processes being examined and to support island inundation model development.
- Labs/others involved** Partners include: Scripps Institution of Oceanography, University of Hawaii, National Ocean Service, National Weather Service, US Air Force, Weather Command, and the US Army Corps of Engineers, Honolulu District.
- Final Products** A data set of coastal waves, winds, water levels, and currents are being acquired under high-wind and typhoon conditions. These data are being used to support a companion work unit (Surge & Wave Island Modeling Studies) to develop, verify, and refine appropriate models.
- Point of Contact** Stanley Boc, [Stanley.J.Boc@erdc.usace.army.mil](mailto:Stanley.J.Boc@erdc.usace.army.mil) or Bill Birkemeier, [William.Birkemeiere@erdc.usace.army.mil](mailto:William.Birkemeiere@erdc.usace.army.mil)